

U.S. Patent Application No. 09/761,561
Response to Office Action Dated August 26, 2004
Amendment Dated November 26, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A microbicidal formulation comprising at least one disinfectant and a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is an amino acid, wherein said amino acid is selected as forming a complex with M at a pH of 2 or less, wherein said amino acid includes a double bonded oxygen, wherein said double bonded oxygen of said amino acid is complexed to M at a pH of 2 or less, and wherein said disinfectant and said complex are not the same, and wherein said complex is a solid in said formulation.

Claim 2 (currently amended): The microbicidal formulation of claim 1, further comprising wherein the microbicidal formulation is mixed with an aqueous solution.

Claim 3 (previously presented): The microbicidal formulation of claim 1, wherein said at least one metal ion is a silver ion or colloidal silver or both.

Claim 4 (previously presented): The microbicidal formulation of claim 1, wherein said at least one metal ion of copper, zinc, mercury, chromium, manganese, nickel, cadmium, arsenic, cobalt, aluminum, lead, selenium, platinum, gold, titanium, tin, barium, vanadium, bismuth, iron,

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strontium, antimony, and the like, and combinations thereof.

Claims 5 and 6 (canceled)

Claim 7 (previously presented): The microbicidal formulation of claim 1, wherein said at least one organic chelating moiety is formed from an alpha-amino acid.

Claim 8 (currently amended): The microbicidal formulation of claim 1, wherein said at least one organic chelating moiety is isoleucine, phenylalanine, leucine, lysine, ~~methionine~~, threonine, tryptophan, valine, alanine, ~~glycine~~, arginine, histidine, or mixtures thereof.

Claim 9 (currently amended): A method to control the growth of microorganisms comprising contacting the microorganisms with a microbicidal formulation comprising a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is an amino acid, wherein said amino acid is selected as forming a complex with M at a pH of 2 or less, wherein said amino acid includes a double bonded oxygen, wherein said double bonded oxygen of said amino acid is complexed to M at a pH of about 2 or less, and wherein said microbicidal composition kills said microorganisms intracellularly.

Claim 10 (previously presented): A method to control biofouling in a system, comprising introducing an effective amount of said microbicidal formulation of claim 1 to said system to

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control said biofouling.

Claim 11 (previously presented): The microbicidal formulation of claim 1, wherein the molar ratio of R to M is from about 1:1 to about 2:1.

Claim 12 (currently amended): The microbicidal formulation of claim 2, wherein said microbicidal formulation is ~~present~~ mixed in said aqueous solution at a concentration of from about 0.001% to about 10% by total volume.

Claim 13 (currently amended): A method to prepare a microbicidal formulation comprising ~~at least one disinfectant~~ and a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is an amino acid, ~~wherein said amino acid is selected as forming a complex with M at a pH of 2 or less~~, wherein said amino acid includes a double bonded oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M ~~and wherein said disinfectant and said complex are not the same~~, wherein said method comprises dissolving a salt containing metal in at least one inorganic acid and an aqueous source; and

adding at least one organic chelating compound containing R to form a metal complex having the formula R-M, wherein the preparation of the formulation occurs at a pH of about 2.0 ~~or less and combining the complex with the at least one disinfectant~~.

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Claim 14 (previously presented): The microbicidal formulation of claim 1, wherein said at least one disinfectant comprises one or more of chlorhexidine gluconate, chlorhexidine digluconate, chlorhexidine dihydrochloride, and chlorhexidine diacetate.

Claim 15 (previously presented): The microbicidal formulation of claim 1, wherein said at least one disinfectant comprises isopropyl alcohol or hydrogen peroxide, or both.

Claim 16 (currently amended): A microbicidal formulation comprising at least one disinfectant and a product obtained by combining at least one metal ion (M) with at least an equimolar amount of at least one organic chelating moiety (R) based on the amount of M, wherein M is microbicidal to at least one microorganism, wherein said at least organic chelating moiety is an amino acid, wherein said amino acid is selected as forming a complex with M at a pH of 2 or less, wherein said amino acid includes a double bonded oxygen, wherein said double bonded oxygen of said amino acid is complexed to M at a pH of about 2 or less, and wherein said disinfectant and said product are not the same.

Claim 17 (canceled)

Claim 18 (previously presented): The microbicidal formulation of claim 16 wherein said at least one metal ion is a silver ion or colloidal silver.

Claim 19 (previously presented): A method to control the growth of a microorganism susceptible to treatment with a metal ion, said method comprising:

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treating said microorganism with the microbicidal formulation of claim 16.

Claim 20 (previously presented): A method of controlling biofouling in a system, comprising introducing to said system an effective amount of the microbicidal formulation of claim 16.

Claim 21 (currently amended): A microbicidal formulation comprising a disinfectant and a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is formed from an amino acid, wherein said amino acid is selected as forming a complex with M at a pH of 2 or less, said organic chelating moiety has a carboxylic group which forms a dative covalent bond with M, wherein said carboxylic group includes a double bonded oxygen which is complexed to M at a pH of about 2 or less, and wherein said disinfectant and said complex are not the same.

Claim 22 (previously presented): The microbicidal formulation of claim 21, wherein M is complexed through the doubled bonded oxygen of the carboxylic group.

Claim 23 (currently amended): A method for preserving cut flowers or plants from pathological microorganisms comprising:

treating said flowers and plants with the microbicidal formulation comprising a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one

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metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is an amino acid, wherein said amino acid is selected as forming a complex with M at a pH of 2 or less, wherein said amino acid includes a double bonded oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M at a pH of about 2 or less.

Claim 24 (currently amended): The method of claim 23, wherein the flowers and plants are treated by immersing a portion of the flower or plant in ~~an aqueous solution of the formulation of claim 1~~ a mixture of the microbiocidal formulation and an aqueous solution.

Claim 25 (currently amended): The method of claim 23, wherein the flowers and plants are sprayed with ~~an aqueous solution of the formulation of claim 1~~ a mixture of the microbiocidal formulation and an aqueous solution.

Claim 26 (currently amended): A method for protecting living flowers or plants comprising treating said flowers and plants with the microbiocidal formulation comprising a complex of the formula R-M, wherein R is at least one organic chelating moiety and M is at least one metal ion, and where R is present in an at least equimolar amount based on the amount of M, and M is microbicidal to at least one microorganism, wherein said at least one organic chelating moiety is an amino acid, wherein said amino acid is selected as forming a complex with M at a pH of 2 or less, wherein said amino acid includes a double bonded oxygen, and wherein said double bonded oxygen of said amino acid is complexed to M at a pH of about 2 or less.

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Claim 27 (currently amended): The method of claim 23, wherein the flowers or plants are treated by introducing into a container of water a tablet comprising the microbicidal formulation of claim 1.

Claim 28 (previously presented): A microbicidal formulation comprising an organo-metallic chelate of silver cations and glutamic acid, wherein the chelate exhibits the structural spectra depicted in Figures 1, 2, or 3.

Claim 29 (previously presented): The microbicidal formulation of claim 1, further comprising artificial or natural colors or flavors.

Claim 30 (previously presented): The microbicidal formulation of claim 1, wherein said formulation is a gel or solid.